

SOS 494/591 and BIO 494/591: Social-Ecological Systems and Adaptation

Class Number:

Credit Hours: 3

Semester & Year:

Prerequisite:

- SOS 494: Sus or Bus Sus major; SOS 110 w/ C or better; SOS 111 or PUP 190 w/ C or better, OR Non-Sus major w/ 2 of the following courses: SOS 100, SOS 110, SOS 111, PUP 190, SOS 300 w/ C or better OR Visiting University Student
- SOS 591: Degree- or nondegree-seeking graduate student
- BIO 494: None
- BIO 591: Degree- or nondegree-seeking graduate student

Instructor

Name: Ganesh Shivakoti, PhD

Office Hours: By appointment

Direct all communication through the Canvas Inbox. See Course Communication Policy below.

Course Textbook and Materials

All readings are provided by PDF or link.

Course Description

The prime goal of this course would be understanding climate change issues, society and ethics by analyzing components of agricultural and other natural resources; food system dynamics as a part of social-ecological systems and their interaction for sustainability in response to climate change. This course will address impact of climate change in both society and ecology and their interaction as a whole with a link in existing policy. These impacts could be in relation to community adaptations by new forms of agro biodiversity, water availability and use practices, soil and land management and ultimately food security.

The course will also identify diverse institutional and community responses in terms of such disturbances by understanding coping strategies adopted by farmers, their relative vulnerability, degree of resilience and local to state level adaptations. Local level adaptations could be diversification of food, stress tolerance and capacity building. The course will also introduce relative sustainability issues in agriculture and other natural resources in relations to climate smart agriculture, conservation agriculture as a means of sustainable climate policies.

Course Outcomes

As a result of taking this class, you should be able to

- CO 1: Examine climate change issues, society, and ethics by analyzing components of agricultural and other natural resources.
- CO 2: Analyze food system dynamics as a part of socio-ecological systems and their interaction for sustainability in response to climate change.
- CO 3: Identify diverse institutional and community responses in terms of such disturbances by understanding coping strategies adopted by farmers.

Course Schedule *(subject to change: see syllabus disclaimer)*

The Topics and Objectives define the main goals for each module of this course.

Module Topics and Objectives	Assignments Due
Course Information	<ul style="list-style-type: none"> • Course Readiness Confirmation • Student Honor Code
Module 1: Historical Overview of Climate Change Sciences 1.1: Examine climate change science and contemporary challenges faced by human beings. 1.2: Relate the climate change issue to complex coupled human and natural systems.	<ul style="list-style-type: none"> • Module 1 Discussion: Historical Overview of Climate Change • Module 1 Reading Response: Complexity of Coupled Human and Natural Systems
Module 2: Climate Change Ethics 2.1: Discuss food ethics from producer to consumer perspectives. 2.2: Relate ethics to broader issue of climate change.	<ul style="list-style-type: none"> • Module 2 Discussion: The Ethics of Climate Change • Module 2 Reading Response: From Field to Fork
Module 3: Framework for Social Ecological System 3.1: Explain the framework for social ecological system 3.2: Examine the dynamics of social ecological system as mediated by institutional mechanisms.	<ul style="list-style-type: none"> • Module 3 Discussion: A Framework to Analyze the Robustness of Social-Ecological Systems • Module 3 Reading Response: Module 3 Readings

	<ul style="list-style-type: none"> • Modules 3 & 4 Discussion: Term Paper Outline
Module 4: Understanding Disturbances, Resilience, and Robustness 4.1: Explain disturbances, resilience, and robustness 4.2: Explain the process of disturbances, resilience, and robustness in the SES framework.	<ul style="list-style-type: none"> • Modules 3 & 4 Discussion: Term Paper Outline • Module 4 Discussion: Resilience • Module 4 Reading Response: Understanding Disturbances and Responses / Community Resilience • Modules 4 & 5 Discussion: Reflective Paper
Module 5: Climate Change Adaptation and Adaptive Co-Management 5.1: Distinguish climate change mitigation, adaptation, and adaptive co-management 5.2: Analyze climate change mitigation measures, adaptive management models, and alternative adaptive co-management process.	<ul style="list-style-type: none"> • Modules 4 & 5 Discussion: Reflective Paper • Module 5 Discussion: Household Level Vulnerability to Drought in Hill Agriculture in Nepal • Module 5 Reading Response: The State of Food Insecurity in the World
Module 6: Land Use Dynamics, Climate Smart Agriculture, Good Agricultural Practices, and Q-Certification 6.1: Describe land use dynamics, climate smart agriculture, good agriculture practices and q-certification. 6.2: Create scenarios for effective and efficient land use in the context of climate change. 6.3: Analyze new approaches of climate smart agricultural practices.	<ul style="list-style-type: none"> • Module 6 Discussion: Land Use Dynamics / The Role of Information Provision • Module 6 Reading Response: The State of Food Insecurity in the World
Module 7: Synthesis on Social Ecological System, Climate Change, and Adaptation 7.1: Analyze synthesis on social ecological system, climate change, and adaptation. 7.2: Synthesize dynamics of social ecological system in the context of climate change.	<ul style="list-style-type: none"> • Term Paper

Assignment Descriptions

Overview

At the start of this course, we will do an overview of climate change sciences and relate it to the complexity of coupled human and natural systems. This means we will spend some time looking at the ethical and historical foundations of climate change. Then you will be guided through the readings on the framework on Socio-ecological systems as mediated by institutional arrangements. Ostrom has worked with her colleagues substantially on the issue, and we will review more than two decades of her progressive views on this issue. Towards the middle of the course, we will begin to unfold the nuts and bolts of social-ecological systems as researched by the research members of the SES Club and Resilience Alliance who are trying to understand disturbances, resilience, and robustness. During the

second half of the course, while you will work on a variety of assignments on issues related to SES and adaptations, our focus will turn to climate change adaptation and adaptive co-management. You will be introduced to the readings on local level innovations on adaptation to climate change and how environmental and resource governance are devolved around adaptive co-management. The evolving land use dynamics embrace climate smart agriculture, good agriculture practices, and q-certification process. The final week's reading and discussion will synthesize the social-ecological system, climate change, and adaptation.

Weekly Reading Response Journal

Each of you are required to complete the assigned readings during the week and post your comments from one of the three papers uploaded for that particular week. Your weekly reading response posted on discussion board each week should not be more than two pages, double spaced, font size 12. Your format for the reading response is as follows: The first half page summarizes the article, followed by another half page identifying the major strength of the paper which will be useful for your career. On the second page, you critique the paper in term of its weakness, and in the last section, you propose a new outline of the paper with additional issues identified.

In addition, you have to critique the other remaining two papers for their strengths, weaknesses, opportunities for improvement, and usefulness for your own professional career. Again, the page limit is two pages, double spaced. The required readings from the journal and book chapters will be uploaded at least one week before the class week.

Term Paper

Each of you will select a current local level adaptation policy related to climate change and prepare a report (around 8 pages, double spaced, font size 12), including an overview of the issue, a description of the project objectives, and details on the substance of the project. Each student will post an outline of the paper in the Discussion Board by week 3 so that feedback can be incorporated into the final report. The instructor will assign each student a peer review partner to comment on the other student's outline. The final paper is due on the last day of the class.

Assignment

Towards the end of the fourth week, each of you will be assigned at least one published material on a controversial issue related to a social-ecological system and adaptation strategy for managing agricultural and related natural resources. You are responsible for thoroughly reading the material and posting three pages, double spaced reflective comments in the discussion board. You will identify and analyze the issue and present solutions. After each of you have posted your written comments, each of you will also respond to at least one post from your colleague by asking questions including further debate and discussion as necessary. I can help facilitate the online discussion. The assignment is due at the end of week four, and the comment is due at the end of week five.

Grading Scale

This course will be graded on an A-E scale.

%	Grade
94 to 100%	A
90 to < 94%	A-
87 to < 90%	B+
83 to < 87%	B
80 to < 83%	B-
77 to < 80%	C+
70 to < 77%	C
60 to < 70%	D
Below 60%	E = Failing, participated in class
-	EN = Failing, never participated
-	EU = Failing, insufficient participation in class and did not complete
-	XE = Academic dishonesty

Grading Procedure

Grades reflect your performance on assignments and adherence to deadlines. Graded assignments will be available within 48 hours of the due date via the Gradebook.

Course Time Commitment

This three-credit course requires approximately 135 hours of work. Please expect to spend around 18 hours each week preparing for and actively participating in this course.

Submitting Assignments

All time frames used in class follow Arizona Mountain Standard Time (MST). Arizona does not observe daylight saving time (DST) from March through November; therefore, the time in Arizona will not align with other places that are on MST for half the year. Use a [Time Converter](#) to ensure you account for the difference in Time Zones. If you are located in time zone other than Arizona MST, go to your

account on the Global Canvas Navigation bar (black background) and edit your settings to reflect your actual time zone. This will adjust the due dates and times in your courses (here is [more information](#) about this).

All assignments, *unless otherwise announced*, MUST be submitted to the designated area of Canvas. Do not submit an assignment via email (unless asked to do so).

Late or Missed Assignments

Notify the instructor **BEFORE** an assignment is due if an urgent situation arises and the assignment will not be submitted on time. Published assignment due dates (Arizona Mountain Standard time) are firm. Please follow the appropriate University policies to request an [accommodation for religious practices](#) or to accommodate a missed assignment [due to University-sanctioned activities](#).

Attendance and Absences

Please follow the appropriate university policies to request absences or accommodations related to [ACD 304–04 Accommodation for Religious Practices](#) and [ACD 304–02 Missed Classes Due to University-Sanctioned Activities](#).

Course Communication Policy

Three Before Me

This course uses a "three-before-me" policy regarding student/instructor communications. When course-related questions arise, please check these three sources for an answer before emailing the instructor with your question:

1. Course Syllabus
2. Canvas Announcements
3. Community Forum: This is a discussion forum in Canvas used for general questions about the course. You are encouraged to respond to your classmates' questions and comments.

Canvas Inbox

All student/instructor communication will be directed through the Canvas Inbox. This ensures the security, privacy, and record of the communication. Note: You must have your primary Canvas email address set as your asurite@asu.edu, not firstname.lastname@asu.edu or a personal email account.

Computer Requirements

A smartphone, iPad, Chromebook, etc. will not be sufficient for completing your work in online courses. While you will be able to access course content with mobile devices, you must use a computer for some assessments.

This course requires a computer with Internet access and the following:

- Web browsers ([Chrome](#), [Internet Explorer](#), [Mozilla Firefox](#), or [Safari](#))
- [Adobe Acrobat Reader](#) (free)
- A webcam, microphone, headset/earbuds, and speaker
- Microsoft Office ([Microsoft 365](#) is free for all currently-enrolled ASU students)
- Reliable broadband internet connection (DSL or cable) to stream video

See [Technology and time: Important factors for ASU Online students](#) for additional information.

Course Delivery and Access

Students will participate in this online course through Canvas. Course content will be delivered in Canvas. Activities used for instruction and assessment of learning include: discussion/presentations; textbook and supplemental readings; individual and group activities/assignments; and case scenarios.

Community of Care

The health of the Sun Devil community is a top priority. This situation has raised many questions. If you have an issue that is not addressed here, please call 1-855-278-5080 or use the live-chat option at uto.asu.edu/ExperienceCenter/chat

For up-to-date information, please visit: [Live well, be well](#)

Help

For technical support, use the Help icon in the black global navigation menu in your Canvas course or call the ASU Help Desk at +1-(855) 278-5080. Representatives are available to assist you 24 hours a day, 7 days a week.

Course Evaluations

Students are expected to complete the course evaluation. Feedback provides valuable information to the instructor and the college and is used to improve student learning. Students are notified when the online evaluation form is available and students can access it through myASU as well. See [Student FAQs](#) for more information.

Accessibility (Online)

All students should have equal technology opportunities in the classroom. For information about the resources offered by ASU and the technologies commonly used in ASU Online courses, consult the following resource: [ASU Online Student Accessibility](#).

Add/Drop/Withdrawals Deadline

ASU's [Academic Calendar](#) contains important dates by which you can add or drop this course without penalty called "Last Day to Drop/Add Without College Approval". After this date, if you choose to withdraw from the course, you may do so by the "Course Withdrawal Deadline," but will receive a 'W' on your official transcript. Consult with your advisor and notify your instructor if you have questions about [Drop/Add and Withdrawal](#).

ASU Course Policies (Online)

Consult [ASU Online Course Policies](#) for information on course time commitment, drop/add dates and withdrawals, photo ID, grade appeals, netiquette, prohibition of harassment, student conduct and academic integrity, Title IX, disability accommodations, inclusion, mental health, course evaluation, trigger warning, academic affairs manual and more.

Discrimination, Harassment, and Retaliation

[ACD-401 Prohibition against Discrimination, Harassment, and Retaliation](#), prohibits discrimination, harassment or retaliation on the basis of race, sex, gender identity, age, religion, national origin, disability, sexual orientation, and veteran status. Violations of this policy may result in disciplinary action, including termination of employees or expulsion of students. Contact the Office of Student Rights and Responsibilities at (480) 965-6547, if you feel another student is harassing you based on any of the factors above; contact the Office of Equity and Inclusion at (480) 965-5057 if you feel an ASU employee is harassing you based on any of the factors above.

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <https://sexualviolenceprevention.asu.edu/faqs>.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling> is available if you wish to discuss any concerns confidentially and privately. ASU online students may access 360 Life Services, <https://goto.asuonline.asu.edu/success/online-resources.html>.

Disruptive Student Behavior

Students are entitled to receive instruction free from interference by other members of the class. An instructor may withdraw a student from the course when the student's behavior disrupts the educational process per the [SSM 201-10 Instructor Withdrawal of a Student for Disruptive Classroom Behavior](#) and [SSM 104-02 Handling Disruptive, Threatening, or Violent Individuals on Campus](#) policies.

Appropriate online behavior (also known as netiquette) is defined by the instructor and includes keeping course discussion posts focused on the assigned topics. Students must maintain a cordial atmosphere and use tact in expressing differences of opinion. Inappropriate discussion board posts may be deleted by the instructor.

Email and Internet

You must have an active ASU email account and access to the Internet. ASU email is an [official means of communication](#) among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly. All instructor correspondence will be sent to your ASU email account.

Emergency Evacuation Plan

Students should be aware of the evacuation route posted on the exit door of each classroom. Students who cannot walk up or down stairs should notify the instructors as early in the course as possible so the instructors can provide information regarding the location of a designated meeting area on each floor of the building.

Grade Appeals

Grade disputes must first be addressed by discussing the situation with the instructor. If the dispute is not resolved with the instructor, the student may appeal to the academic unit offering the course per the [University Policy for Student Appeal Procedures on Grades](#). Undergraduate students, please see additional instructions for [undergraduate College of Global Futures courses](#). Graduate student grade appeals are initiated within the school offering the course (please email CGF@asu.edu for more information about initiating a grade appeal for a graduate course in the College of Global Futures).

How Long Students Should Wait for an Absent Instructor

In the event the instructor fails to indicate a time obligation, the time obligation will be 15 minutes for class sessions lasting 90 minutes or less, and 30 minutes for class sessions lasting more than 90 minutes. Students may be directed to wait longer by someone from the academic unit if they know the instructor will arrive shortly.

Power and System Outages

In the event of a power outage or other event affecting the ability of the University to deliver ground and online classes, any decision to cancel classes will be announced using the ASU emergency notification system for ground campus students. Ground campus students should register with the [ASU LiveSafe](#) mobile app. Additionally, ground campus and online students can learn about power and system outages on the [ASU System Health](#) site.

Prohibition of Commercial Note Taking Services

Course content, including lectures, are copyrighted materials. Students may not share outside the class, upload, sell, or distribute course content or notes taken during the conduct of the course (see [ACD 304-06 Commercial Note Taking Services](#) for more information).

Student Code of Conduct and Academic Integrity

Students have the responsibility to understand and follow ASU's [Student Code of Conduct](#) and [Academic Integrity Policy](#). You may face ethical decisions during your time as a student. If you're not sure whether or not something is permitted, it is your responsibility to ask questions or find out by doing more research using the links above. Any violations in this course are subject to sanctions and will be reported to the School of Sustainability and the college or school of your major.

The Office of Student Rights and Responsibilities accepts [incident reports](#) from students, faculty, staff, or other persons who believe that a student or a student organization may have violated the Student Code of Conduct.

Academic Integrity (also known as cheating, copying others' work, uploading your work online to encourage cheating by others, or even reusing your own work) falls under the Student Code of Conduct. Possible sanctions for violations include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), suspension, and expulsion.

Beware that some websites promote themselves as tutoring and educational resource sites, but may actually be sites that put you at risk for an academic integrity violation if you are using the services to submit work that is not your own or gain knowledge of what to expect on a quiz or exam.

Important: Students must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on grounds of suspected copyright infringement.

Students with Disabilities

All students requesting accommodations for disabilities must work with the [ASU Student Accessibility and Inclusive Learning Services](#), the central location for establishing eligibility and obtaining services and accommodations for qualified students with disabilities.

You may contact the ASU Student Accessibility and Inclusive Learning Services at (480) 965-1234 or email directly at student.accessibility@asu.edu.

Technical Support Contact Information

If you are experiencing technical issues, visit the [My ASU](#) "Service Center" tab for immediate support, to review answers to frequently asked questions, or to submit a request for service.

The number for immediate assistance is 1-855-278-5080 with staff available 24 hours/day, 7 days/week to help direct your call. Also see [ASU's Contact Us](#) page. Known issues and system outages will be shared on [ASU's System Health](#) site.

Students also have access to several [computing sites](#).

Additional Information and Resources

- [School of Sustainability](#) – this course is offered through the School of Sustainability at Arizona State University. Questions about the course should first be addressed with the instructor. If necessary, you can also contact the school at (480) 727-6963 or schoolofsustainability@asu.edu.
- [Career Services](#) – offers assistance to students in choosing their major, setting career goals, interviewing and job hunting strategies. Students pursuing a degree program through the School of Sustainability also have access to a [sustainability career advisor](#).
- [Counseling Services](#) – professional counseling and crisis services for students experiencing emotional concerns, problems in adjusting, and other factors that affect their ability to achieve their academic and personal goals. Support is available 24/7 between campus locations and EMPACT's 24-hour ASU-dedicated crisis hotline.

- [Financial Aid and Scholarship Services](#) – offers information and applications for student funding such as grants, loans, scholarships and student employment.
- [GPA Calculator](#) – students can use this calculator to project their GPA.
- [Health Services](#) – provides non-emergency medical health care to all ground campus ASU students regardless of insurance status. Most visits with a physician or nurse practitioner are free of charge, but fees will be incurred for x-rays, lab results, etc.,
- [Libraries](#) - offers 24/7 access to librarians through "Ask a Librarian" online chat and help by librarians in person at the Reference Desk during most hours the libraries are open.
- [ASU Online Students](#) – students pursuing fully online programs have access to success coaches and additional tips for success.
- [Sun Devil Fitness](#) – offers individual and group fitness opportunities, as well as information on nutrition and wellness, and massages. Use of the general facilities (weights, circuit training and cardio machines) are free, other services (yoga classes, massages) are fee-based.
- [Tutoring and Writing Centers](#) – provides students with academic support services such as tutoring, peer advising, computer assisted instruction, writing support, and supplemental instruction
- [Contact Arizona State University](#) – provides frequently asked question resources and contact information for new questions.

Syllabus Disclaimer

All syllabi are subject to minor changes to meet the needs of the instructor, school, or class. Every effort will be made to avoid changing the course schedule, but the possibility exists that unforeseen events will make syllabus changes necessary. The instructor reserves the right to make changes to the syllabus as deemed necessary. Students will be notified in a timely manner of any syllabus changes. Please check your ASU email and the Announcements on the course site often.

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